A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 59951

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Open elective

Civil Engineering

15UCH951- CORROSION SCIENCE AND ENGINEERING

(Common to CSE, ECE, EEE, EIE, IT, Mechanical)

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The rusting of iron is catalysed by which one of the following CO1- R

   (a) Iron (b) Oxygen (c) Zinc (d) H+

2. Metal at the top if electromotive series is CO1- U

   (a) Most stable (b) Least active (c) Most Noble (d) Most Active

3. Corrosion can be prevented by CO2- R

   (a) Alloying (b) Tinning (c) Galvanizing (d) All of the above

4. _____ coatings provide excellent corrosion protection in sea waters CO2- U

   (a) Rubber (b) Polymer (c) Nickel (d) None of the above

5. Galvanizing is the process of coating iron with CO3- R

   (a) Tin (b) Zinc (c) Copper (d) Nickel

6. The rusting of iron is catalysed by which one of the following CO3- R

(a) Iron (b) Oxygen (c) Zinc (d) H+

7. Corrosion of metals involves CO4- R

(a) Physical reactions (b) Chemical reactions

(c) Both (d) None of the above

8. Passivity is due to CO4- R

(a) Higher EMF (b) Lower EMF (c) Oxide film (d) All of the above

9. Main form of ceramic degradation CO5- U

(a) Corrosion (b) Weathering (c) Dissolution (d) Swelling

10. The rusting of iron is catalysed by which one of the following CO5- U

(a) Iron (b) Oxygen (c) Zinc (d) H+

PART – B (5 x 2= 10Marks)

11. Distinguish between wet and dry corrosion CO1- U

12. Define a corrosion inhibitor with an example CO2- U

13. Define biological corrosion. CO3- U

14. Define cathodic protection CO4- U

15. List any four factors for the corrosion protection management. CO5- U

PART – C (5 x 16= 80Marks)

16. (a) Explain the process of electroplating with suitable example. Mention the uses of electroplating. CO1- U (16)

Or

(b) Discuss the mechanism of electrochemical corrosion with suitable example. CO1- U (16)

17.	(a)	What are the five principles used to prevent corrosion and write short notes on the material selection, environmental consideration and the design parameters to prevent corrosion.	CO2- U	(16)
		Or		
	(b)	Explain in detail the five basic principles with suitable examples in order to reduce the rates of corrosion.	CO2- U	(16)
18.	(a)	Explain the method of zinc coating by alloying and electrophoretic coatings.	CO3- U	(16)
		Or		
	(b)	Discuss briefly the methods of electro painting and powder coatings with suitable example.	CO3- U	(16)
19.	(a)	Explain in detail the biological corrosion with suitable examples.	CO4- U	(16)
		Or		
	(b)	Explain in detail the halogenic corrosion of metals with suitable examples.	CO4- U	(16)
20.	(a)	Explain briefly about the corrosion protection management in various industries.	CO5- U	(16)
		Or		
	(b)	Discuss briefly the corrosion damage and protection management followed in the design of process industries.	CO5- U	(16)